

AEMA Order 2222 Straw Proposal

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February 3, 2021
PJM DIRS

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Advanced Energy Management Alliance (AEMA) advocates for policies that empower and compensate customers appropriately--to contribute energy or energy-related services or to manage their energy usage--in a manner which contributes to a more efficient, cost-effective, resilient, reliable, and environmentally sustainable grid.

Our members are providers and supporters of distributed energy resources (DERs), including demand response (DR) and advanced energy management, united to overcome barriers to nationwide use of demand-side resources.

Fully Enabling Distributed Energy Resources

- Customers and States are increasingly deploying DER
- These DER are capable of providing significant value to the system and ratepayers
- Failure to fully integrate DER in any market/service will compromise competition, reliability, and state policy goals
- ISOs should create participation models that will drive significant DER participation in wholesale markets, not just seek to strictly comply only with FERC's enumerated requirements

Overarching Goals of Straw Proposal

- Allow integration of injection and load-modification abilities into a single resource
 - Allow DER customers using multiple strategies to manage energy costs to participate in markets without unnecessary administrative or cost barriers
- Integration of DER in all ISO-administered markets, including capacity, energy (including Real Time), and ancillary services
- Participation frameworks should be technology-neutral and able to integrate a range of new DER technologies and configurations

Order 2222: C.1. Participation Model

- “Have tariff provisions that **allow DER aggregations to participate directly** in RTO/ISO markets.” (129)
- “Establish **DER Aggregators as type of market participant...**” (129)
- “Allow DER Aggregators to register DER aggregations under **one or more participation models** in the RTO/ISO tariff that **accommodate the physical and operational characteristics of the DER aggregation.**” (129)
- “Can comply... by **modifying existing participation models** to facilitate the participation of DER aggregations, or by **establishing one or more new participation models** for DER aggregations or by adopting a combination of those two approaches.” (130)
- “...**the means by which an aggregation is able to provide wholesale services does not change the value of that service to the wholesale grid.**” (145)
- “... the **requirements in Order No. 745 would apply** to demand response resources participating in heterogeneous aggregations.” (145)

Straw Proposal:

- Leave existing Demand Response and Energy Efficiency participation models intact
- Establish a new DER Participation Model that accommodates DER that is capable of either on-site load reduction and/or injection of electricity to the grid
- If there are forms of DER that fit better in existing participation models than in the new DER participation model(s), consider modifying existing model(s) to integrate those resources (e.g., baseline for electric vehicles reducing consumption)

Straw DER Participation Model - Overview

- Treat DER as a single resource for market purposes.
 - Delivered product is the sum of the injection and load offset components.

- DERs should also have the option to enroll behind-the-meter (BTM) resources as if they were front-of-meter (through direct metering and settlement of the DER) and not only under existing DR models.

Definitions

- **DER** refers to individual energy **assets**.
 - Multiple DER assets behind single EDC account that will not be submetered can be registered as single asset whose capabilities are the combined capabilities of the applicable DER
 - For sub-metered EDC accounts, allow all DER behind each of those meters to be combined
- **DER Aggregation** means the **aggregation of multiple DERs**

Straw DER Participation Model Overview

- Treat DER as a single resource for market purposes
 - Injections compensated as generation
 - Load offsets are compensated as demand response
 - Full LMP + T&D Gross up, Predicated on Order 745 Net Benefits Test
 - If offer does not pass Net Benefits Test, DER can self-schedule, but does not receive energy payment
 - Delivered product is the sum of the injection and load offset components.
 - Capacity commitment, energy offers, A/S offers, and dispatch are made to represent full capability including onsite load reduction and net injection

Straw DER Participation Model Overview

- DERs should also have the option to enroll BTM resources as if they were front-of-meter (through direct metering of the DER) and not under existing DR models.
- **Must Offer Requirements**
 - Do not require must-offer simply to participate in Participation Model, but make requirements specific to services provided (e.g., capacity)
 - Must recognize retail-level opportunity costs and use cases
 - Should not prevent dual participation
 - Exclude non-dispatchable DER like solar and wind
- **Accommodate Seasonal Resources**
 - Accounting for the attributes of DER requires allowing participation from seasonal resource

Energy Market

- Allow participation in both Day-Ahead and Real Time Energy Markets
 - Treat DER as a single resource.
 - Injections compensated as generation
 - Load offsets are compensated as demand response
 - Full LMP + T&D Gross up, Predicated on Order 745 Net Benefits Test
 - If offer does not pass Net Benefits Test, does not receive energy payment
- Do not unnecessarily limit participation
 - PJM model prevents economic offering if “rational” customer would already be reducing load regardless of LMPs
 - AEMA recommends removing this requirement as it is overly subjective

Energy Settlement

DER delivered energy will be the sum of the load reduction contribution and/or the injection contribution

- The load reduction contribution will be the total load reduction that occurred from both Load Modification Resources and DER that served on-site load.
 - Settled at LMP when LMP is greater than or equal to Net Benefits Threshold
 - Includes Gross Up Factors for avoided use of Transmission and Distribution
- Injection contribution is simply metered injection
 - Settled at LMP
- Allow settlement to different entities for energy, capacity, and ancillary services
- DER Assets should have the ability for direct settlements, separate from the rest of the customer's load, even if located at the customer facility

Frequently Dispatched Resources

- Resources that are frequently dispatched may suffer from baseline erosion.
- This can be addressed through:
 - Adding back dispatch events
 - Direct metering of the DER

These are discussed in more detail later in the presentation

Cost Justification

- Do not require cost justification for offers for DER, below \$1,000/MWh
 - Cost justification required to address issues of seller-side market power
 - DERs will not have market power, making cost-based offers unnecessary
- If cost justification is required, allow inclusion of opportunity costs not specific to the energy markets
 - Retail opportunity costs
 - Customer-specific opportunity costs

Ancillary Services

- All Ancillary Services use the same approach as for energy:
 - DER offers as a continuous resource
 - Delivered quantity is sum of load reduction and injection components
- Non-dispatchable DER is not required to offer ancillary services

Capacity

- Capacity of a DER is the sum of what it can inject and the onsite load that it can reduce
- Loads that provide capacity as DR should not face additional requirements by becoming a DER

Capacity Injection Rights

- For deliverability, require CIR **OR** comparable state-jurisdictional interconnection
 - Allow State-jurisdictional interconnection to obviate the need for additional for additional PJM studies
 - Comparable state-jurisdictional interconnection agreement allows Full Dispatch of DER in conjunction with full dispatch of all other DER on the distribution feeder.
 - “Full Dispatch” is defined as the lower of the maximum injection capability of the combined system (not necessarily equal to the sum of maximum output of components) OR the maximum quantity that will be offered into any wholesale market

Order 2222: C.3. Double Counting / Dual Participation

- “... (1) **allow DER that participate in one or more retail programs to participate in its wholesale markets**; (2) **allow DER to provide multiple wholesale services**; and (3) **include any appropriate restrictions on the DER’s participation in RTO/ISO markets** through DER aggregations, if narrowly designed to avoid counting more than once the services provided by DER in RTO/ISO markets. (160)
- “Describe how the RTO/ISO will properly account for the different services that DER provide in the RTO/ISO markets.” (160)
- “**RERRAs may decide whether to permit the customers of small utilities to participate** in the RTO/ISO markets through DER aggregations and RERRAs continue to have authority to condition participation in their retail DER programs on those resources not also participating in RTO/ISO markets...and **RERRAs continue to have authority to condition participation in their retail DER programs on those resources not also participating in RTO/ISO markets**, which should allow them to mitigate any double-compensation concerns.” (162)
- “A **single DER can... be compensated in each for providing ‘distinctly different services.’**” (164)

Double Counting/Dual Participation

- Do not place restrictions on wholesale participation of a DER participating in a retail program
- Instead, use existing mechanisms or create mechanisms to prohibit the same DER from both a) reducing the amount of a service an RTO/ISO procures on a forward basis and, b) acting as a provider of that service in the same delivery period
 - Can be either state or ISO, no need to duplicate.
- Use the existing mechanisms to prevent double-counting
 - Reconstitution rules- PJM Manual 19
- Any additional mechanism should be narrowly tailored

Charging Energy for Energy Storage

- Energy storage components of DER will be treated under rules established for charging energy according to Order 841
 - Requires EDC cooperation to net energy for storage located at a customer facility but participating directly in the market
 - If EDC cannot net, only retail charge applies
 - Would require submetering of battery

Order 2222: G. Metering and Telemetry System Requirements

- “Establish market rules that address metering and telemetry hardware and software requirements necessary for DER aggregations to participate in RTO/ISO markets.” (262)
- “Explain... why proposed metering requirements are necessary (e.g., for the DER aggregator to provide the settlement and performance data to the RTO/ISO... or to prevent double counting of services...)” and why its proposed telemetry requirements are necessary (e.g., for the RTO/ISO to have sufficient situational awareness to dispatch the aggregation and the rest of the system efficiently).” (264)

Distinction between Metering and Telemetry

- Metering is necessary for settlements, to show you have done what you said you would do
- Telemetry is to inform the operator of actionable deviations (RT operations)
 - Measures substantial changes in output or substantial deviation (trips, or not on)
 - Why is telemetry required for generation- they are big and the operator needs to know

Metering Options

Allow DER to choose between metering options:

1. Metering Option 1: Meter at Retail Customer Meter Level
 2. Metering Option 2: Sub-meter individual DER
- Allow DER within the same DER Aggregation to utilize different Metering Options

Metering Option 1: Retail Customer Meter Level

1. DER can choose this method
2. With a baseline methodology for load reductions

Metering Option 2: Direct Metering of Individual DER

1. Resource could look like a front-of-the-meter generator to the RTO/ISO
 2. Depending on DER, no baseline methodology required
 3. DER can choose this option
 - a. More than one DER behind the same inverter can participate as single resource, with metering at the inverter
 4. If separate DER resource will be metered at the customer meter, net out the performance of submetered resource
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- FERC decision approving CAISO submetering of EVSE in ER20-2443-000 is good example, where CAISO proposed to allow EVSE to be treated as a separate load curtailment measure when providing demand response at facilities with onsite load

Order 2222: F. Information and Data Requirements: Baselines / Measurement & Verification

- “Require each **DER aggregator to maintain and submit aggregate settlement data for the DER aggregation**, so the RTO/ISO can regularly settle with the DER aggregator, and to provide, upon request from the RTO/ISO, performance data for individual resources in a DER aggregation for auditing purposes.” (240)
- “Requirements for settlement and performance data **should be consistent with the settlement and auditing data requirements for other market participants.**” (240)

Baseline Methodology: Most Recent Days + Dispatch Addback

- Establish baseline from most recent days
- Add-back dispatch events
 - Otherwise, frequently dispatched resources will be unfairly penalized

Best Practice: NYISO

- FERC has approved DER Baseline Approach in NYISO that
 - Includes only last 10 days
 - Hour-long intervals
 - Adds back any “event” performance if the DER clears the energy market
 - DER receives full LMP unless below Net Benefits threshold

Data and Telemetry

- Principle: Minimum requirement for settlement and operator actionability for metering and telemetry respectively
- Metering Data:
 - Energy, Capacity, Ancillary Services: (after event)- require hourly data after the fact (DR Hub) for settlement and performance calculations
 - Synchronous Reserves requires 1 min data after the event
- Telemetry:
 - No telemetry required as default
 - Regulation participation requires RT telemetry, hourly meter data is required upon request
 - Require only actionable telemetry

Focus on Quality of Data, not Hardware

- Any requirement should specify quality of data, not specific hardware requirements

Order 2222: D. Locational Requirements

- “Establish locational requirements for DER to participate in a DER Aggregation that are **as geographically broad as technically feasible.**” (204)
- “Provide detailed technical explanation for the geographical scope of proposed locational requirements.” (204)

Locational Requirements

- Identify areas where aggregation across multiple pricing nodes presents challenges (e.g., congestion, price differentials if multiple nodes were combined)
- Allow Capacity Resource aggregations to be broader than energy market aggregations
 - Valuable for qualification and administrative purposes

D. Locational Requirements

AEMA Recommendations

- Allow aggregations across multiple nodes, but allow dispatch more granularly
- Do not require that aggregations be bound by LSE territories
- Consider different geographic scopes aggregations providing different services (e.g., capacity vs. energy)
 - Separate aggregation of a resource and aggregation of performance

Straw Proposal:

- Aggregate up to 5 MW over multiple P Nodes within a Zone
- Aggregation over 5MW must be within one P Node
- For capacity- allow aggregation within zone, but more granular energy market participation

C.4. Minimum Aggregation Size

AEMA Recommendations

- 100 kW minimum size continues to be best practice for purposes of establishing DER Aggregation
- Separate aggregation for purpose of min size, with aggregation (netting) for performance (dispatch and assessment for purposes of payments and penalties)
 - PJM model is currently similar

Order 2222: C.4. Maximum Size for DER in Aggregation

- DER Participating in an Aggregation: “**Propose maximum capacity requirement for individual DER participating through a DER aggregation or, alternatively, explain why such a requirement is not necessary**” (181)
- “Allow a single qualifying DER to avail itself of DER aggregation rules by serving as its own DER Aggregator.” (185)

AEMA Recommendation:

- Maximum Individual DER Size: Injection limit of 20 MW

Best Practice:

- NYISO MST Section 2.4 defines a single DER as having an injection limit of 20 MW

Notes

- This proposal starts with a fully-interconnected resource and does not address issues of interconnection (either FERC- or State-jurisdictional) or coordination with distribution utilities and RERRAs. Nothing in the presentation should be read as allowing a site to exceed the conditions of its interconnection

Thank you

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